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Notes on the Flora of Southeastern Kentucky, with a List of
Plants collected in Harlan and Bell Counties in 1893.

BY T. H. KEARNEY, JR.

Last summer while debating the weighty question of the selection of a field for botanical exploration, it occurred to me that the mountain counties of Southeastern Kentucky presented a desirable region. Here was a country almost overlooked by the collector. Since Rafinesque made his journey to the "Wasioto or Cumberland Mountains," little work had been done in that part of the State. Moreover, the position of that country on the southern edge of the northern flora, as usually defined, seemed to promise the finding of southern plants new to the northern range.

Unfortunately I was unable to get into the field before the first of August. Leaving Knoxville on that date, I went to Pennington's Gap, Va., on a branch of the L. & N. R. R. Here I secured the services of a negro, a team of mules and a wagon, and by means of this combination reached Harlan C. H., Ky., after a ride of twenty-five miles over the roughest road imaginable.

Leaving Pennington's, we followed the North Fork of Powell's River through the gap in the main range of the Cumberland Mountains. Then the road crossed Little Black Mountain, a parallel ridge, and descended gradually into the valley where the three "forks" unite to form the Cumberland River.

Harlan "Town" proved to be a fair type of the Southern mountain village—dirty, exceedingly ugly and thoroughly lawless. A stay of a few days here convinced me that I must get further into the mountains to secure good results, though at least one plant of interest, *Viola villosa*, Walt., was found here. It is a well marked species, and no one who has seen it growing would consider it otherwise. The roundish, cordate or reniform leaves lie flat on the ground. The appressed pubescence of the upper surface gives it a silvery appearance. The under surface is purplish on the veins, or sometimes the whole surface has a purple hue. In the same vicinity, *Clethra acuminata*, Michx., *Oxalis recurva*, Ell., *Magnolia tripetala*, L. and *Houstonia tenuifolia*, Nutt. were collected.

From Harlan I went up the Poor Fork of the Cumberland, by the same primitive conveyance, to Poor Fork Postoffice, about twenty-one miles above Harlan. Here, at the house of the worthy and hospitable postmaster, I stayed for nearly a month.

The Poor Fork flows through a narrow valley between two ranges of the Cumberland system, the Big Black and the Pine Mountain. The Big Black Mountain is over 3,000 feet high at points; the Pine is much lower. In geological formation, the district is almost entirely sandstone and shale. On the Pine there is an occasional outcropping of limestone.

In the immediate vicinity of Poor Fork I collected *Campanula divaricata*, Michx., *Hydrastis Canadensis*, L., *Panicum capillare campestre*, Gattinger, and *Panicum ramulosum*, Michx. (growing on moist shale on the river bank). A form of *Acalypha Virginica* L. with every part, even the bracts, much reduced in size, was abundant in a low, sandy field.

On the Big Black Mountain, *Azalea lutea*, L.; *Galium latifolium*, Michx.; *Carex aestivalis*, M. A. Curtis; *Trautvetteria Carolinensis* (Walt.) A. M. Vail; *Astilbe biternata* (Vent.) Britt. (*A. deandra*, Don.) and *Holcus lanatus*, L., appeared.

On a spur of the Big Black known as Benham's Spur, *Panax quinquefolia*, L.; *Thalictrum coriaceum* (Britt.) Small*; *Aruncus Aruncus* (L.) Karst.; *Magnolia Fraseri*, Walt.; *Hystrix Hystrix* (L.) MacMillan, and *Corycarpus diandrus* (Michx.) Kuntze were found.

The Pine Mountain presented a more varied and interesting flora. *Magnolia macrophylla*, Michx., very conspicuous because of the whitened under surface of its huge leaves, with large ovoid or semi-globose cones of a dull flesh-color, *Solidago erecta*, Pursh, *Aster leiophyllus lanceolatus*, Porter, *Meibomia laevigata* (Nutt.) Kuntze, *Clintonia umbellata* (Michx.) Torr., *Disporum lanuginosum* (Michx.) Britt. and *Pogonia trianthophora* (Sw.) B. S. P. were collected on its slopes.

A ledge of exposed, dry sandstone at the summit yielded *Capnoides sempervirens* (L.) Borkh., *Lechea racemulosa*, Michx., rather depauperate specimens of *Gnaphalium Helleri*, Britt., *Eupatorium*

* Mem. Torr. Club, iv. 96.

pubescens, Muhl., *Agrostis intermedia*, Scribn.,* *Panicum commutatum latifolium* Scribn. n. var.† and a *Lysimachia*, nearest to *L. radicans*, but differing in its erect habit and broader and shorter leaves, less pointed at either end.

On the shaded north side of this ledge *Heuchera Rugelii*, Shuttlew., *Peranium pubescens* (Willd.) C. C. Curtiss, *Leptorchis liliifolia* (L.) Kuntze, and *Asplenium montanum*, Willd., were found.

After several weeks spent in the neighborhood of Poor Fork, I resolved to try the valley of the Cumberland at some point further down. Leaving my quarters in Harlan county, I had a two days' ride over an abominable road to Wasioto, a small lumber town fifty-five miles below Poor Fork Postoffice, and about one mile above Pineville, the county-seat of Bell county.

Along the road I saw great quantities of *Panicum flexile* (Gattinger) Scribn.,‡ a species resembling *P. capillare*, but very distinct.

About nine miles above Wasioto the Cumberland enters a gorge locally known as the "Narrows" (Narrows), through which it flows for several miles. Here, on the bluffs, many interesting plants were collected. Among them I would mention *Rubus odoratus*, L., *Stuartia pentagyna*, L'Hér., *Scutellaria saxatilis*, Riddell, *Aster prenanthoides*, Muhl., and a *Houstonia* which I refer, doubtfully, to Pursh's *H. tenella*.§

* "Spikelets not crowded, pedicels capillary, usually much longer than the spikelets; flowering glume about $\frac{3}{4}$ line long, sometimes with a short and delicate dorsal awn.

"Culms erect or geniculate below, 2-3 ft. high; leaves spreading, 2-6 lines wide, the uppermost 4-8 in. long; panicle 7-14 in. long, pyramidal, the rather firm branches at first erect, those uppermost often spreading while the base of the panicle is yet included in the loose, upper leaf-sheath. Spikelets less crowded and smaller than in *A. elata*, with the flowering glume broader at the more rounded apex.

"Intermediate between *A. elata* and *A. perennans*."

† "Leaves very broad, panicle large, the widely spreading branches few-flowered."

‡ *Panicum capillare flexile*, Gattinger, Cat. Tenn. Fl., 94 (1887).

§ *Houstonia tenella*, Pursh, Fl. Am. Sept. 106?

Aspect and habit of *H. serpyllifolia*. Perennial by extensively creeping, filiform rootstocks. Stems slender, smooth, much branched. Leaf 5-7 mm. long, oblong-spatulate, obtuse or slightly pointed at apex, tapering into a slender petiole from one-fourth to twice as long, conspicuously veined; the upper surface, with the margin and petiole, furnished with scattered, strigose, white hairs; flowers few on very long peduncles, deep blue, about one-half as large as those of *H. serpyllifolia*; tube of corolla very slender, about twice as long as the lobes and 3 to 4 times as long as the lobes of the very small calyx. Mature fruit not seen.

For the entire fifty miles between Poor Fork and Wasioto, the Pine Mountain remains the same in height and character. It is only broken at Wasioto, where the Cumberland passes through it. The Black Mountain, however, breaks up into a number of lesser ridges, of which the chief is known as the Log Mountain.

The Pine still proved the most interesting collecting ground. In a ravine on the south slope, a single specimen of the rare and little-known *Gaylussacia ursina* (M. A. Curtis) Torr. & Gray, a much branched shrub about 1 m. in height, was found. The best it could yield in the way of inflorescence or fruit was a few clusters of apparently unfertilized ovaries. *Lobelia puberula*, Michx., *Galax aphylla*, L., and the magnificent grass, *Erianthus contortus*, Ell., also appeared in the ravine.

On the dryer ridges of the Pine, *Eupatorium verbenæfolium*, Michx., *Chrysopsis graminifolia*, Nutt., *Juncus biflorus*, Ell., and an interesting little *Panicum* with membranaceous leaf-margins, *Panicum nitidum crassifolium*, A. Gray, possibly Elliott's *P. ciliatum*, flourished. In the richer soil of the north slope grew *Aristolochia Siphon*, L'Hér., *Pyrularia pubera*, Michx., *Cimicifuga Americana*, Michx. and *Eupatorium sessilifolium* L.

In the neighborhood of Wasioto, a well-marked variety of *Panicum capillare*, *Panicum capillare geniculatum* Scribn.,* was found to be frequent in the loose soil of railroad embankments.

On Clear Creek, *Oxypolis rigida* (L.), Raf.,† *Solidago arguta*, Ait., *S. patula*, Muhl. and *S. Curtisii*, Torr. & Gray, were collected. On dry slate along the same stream *Phyllanthus Carolinensis*, Walt., and *Aster dumosus*, L., were found.

Towards the end of September I left Kentucky, regretting much that circumstances had not permitted me to begin collecting earlier in the season in a country whose flora would seem to promise so much of interest.

Appended is a complete list of the plants collected in Bell and

* "Culms usually prostrate or ascending, geniculate or much branched, with numerous oblong or ovate diffusely branched panicles. Spikelets more numerous than in var. a [the ordinary form]. This corresponds to var. *geniculatum* of *P. proliferum*."

† *Tiedemannia rigida*, Coult. and Rose.

Harlan counties. For the names of the grasses I am indebted to Prof. F. Lamson-Scribner.

- 176. *Asplenium montanum*, Willd.
- 323. *Asplenium Trichomanes*, L.
- 48, 210, 395. *Camptosorus rhizophyllus* (L.) Link.
- 47. *Cystopteris fragilis* (L.) Bernh.
- 142. *Dicksonia punctilobula* (Michx.) A. Gray.
- 389, 573. *Dryopteris intermedia* (Muhl.) A. Gray.
- 61. *Dryopteris marginalis* (L.) A. Gray.
- 211. *Dryopteris Novæboracensis* (L.) A. Gray.
- 129. *Polypodium vulgare*, L.
- 566. *Pteris aquilina*, L.
- 130. *Tsuga Canadensis* (L.) Carr.
- 2, 134, 436. *Alisma Plantago*, L.
- 187. *Sagittaria latifolia*, Willd.
- 23. *Agrostis alba*, L., var.
- 221, 283, 367, 382. *Agrostis elata*, Trin. (?)
- 39, 174. *Agrostis intermedia*, Scribn.
- 381. *Agrostis perennans*, Tuckerm.
- 384. *Andropogon nutans*, L.
- 364, 377. *Andropogon provincialis*, Lam.
- 379. *Andropogon scoparius*, Michx.
- 313, 368. *Aristida gracilis*, Ell.
- 314. *Aristida purpurascens*, Poir.
- 365. *Arundinaria gigantea tecta* (Walt.) Scribn. [*Arundo tecta*, Walt.].
- 36, 74, 279. *Brachyelytrum erectum* (Schreb.) Beauv.
- 276. *Bromus ciliatus purgans* (L.) A. Gray.
- 375. *Cinna arundinacea*, L.
- 235. *Corycarpus diandrus* (Michx.) Kuntze.
- 43. *Danthonia spicata*, Beauv.
- 140. *Eleusine Indica* (L.) Gaertn.
- 236. *Elymus Canadensis*, L.
- 196, 263, 370. *Eragrostis capillaris*, Nees.
- 150. *Eragrostis Frankii*, Meyer.
- 55. *Eragrostis hypnoides* (Lam.) B. S. P.
- 28, 158. *Eragrostis Purshii*, Schrad.
- 385. *Erianthus contortus*, Ell.
- 93. *Holcus lanatus*, L.
- 371. *Homalocenchrus Virginicus* (Willd.) Britton.
- 237. *Hystrix Hystrix* (L.) MacMillan.
- 383, 578. *Muhlenbergia diffusa*, Schreb.
- 366. *Muhlenbergia Mexicana* (L.) Trin.
- 33, 234. *Muhlenbergia tenuiflora* (Willd.) B. S. P.
- 309, 380. *Panicum agrostidiforme*, Lam.
- 372. *Panicum anceps*, Michx.

151. *Panicum capillare campestre*, Gattinger.
 317, 335, 378, 497. *Panicum capillare geniculatum*, Scribn.
 152, 229. *Panicum clandestinum*, L.
 34, 54. *Panicum commutatum*, Schultes.
 299. *Panicum commutatum latifolium*, Scribn.
 316, 425, 567. *Panicum filiforme*, L.
 312, 579. *Panicum flexile* (Gattinger) Scribn.
 53. *Panicum laxiflorum*, Lam.
 52. *Panicum microcarpon*, Muhl.
 594. *Panicum nitidum crassifolium*, A. Gray.
 58, 141. *Panicum nitidum pubescens* (Chapm.) Scribn. [*Panicum laxiflorum pubescens*, Chapm.]
 315, 374. *Panicum proliferum*, Lam.
 35, 50, 57. *Panicum ramulosum* Michx.
 20. *Panicum sanguinale*, L.
 258, 298, 376. *Panicum Walteri*, Poir.
 172. *Panicum* sp.
 195, 253. *Paspalum læve*, Michx.
 26, 56, 386. *Paspalum longepedunculatum*, Le Conte.
 197. *Paspalum setaceum*, Michx.
 373. *Sieglingia flava* (L.) Kuntze.
 278, 369. *Sporobolus vaginæflorus* (Torr.) Vasey.
 125, 155. *Carex æstivalis*, M. A. Curtis.
 119. *Carex cephalophora*, Muhl.
 319. *Carex crinita*, Lam.
 156. *Carex rosea radiata*, Dewey.
 73, 115. *Carex virescens*, Muhl.
 281. *Carex* sp.
 595. *Cyperus diandrus*, Torr.
 201. *Cyperus flavescens*, L.
 222, 318. *Cyperus retrofractus*, Torr.
 204, 411. *Cyperus strigosus*, L.
 463. *Dulichium spathaceum* (L.) Pers.
 27, 202. *Eleocharis ovata* (Roth) R. Br.
 46. *Kyllingia pumila*, Michx.
 24, 205. *Rynchospora glomerata* (L.) Vahl.
 428. *Scirpus cyperinus* (L.) Kunth.
 149. *Scirpus debilis*, Pursh.
 3. *Scirpus polyphyllus*, Vahl.
 108. *Scleria pauciflora*, Muhl.
 173, 466. *Scleria triglomerata*, Michx.
 49, 97. *Fimbristylis capillaris* (L.) A. Gray.
 448, 590. *Commelina nudiflora*, L.
 21. *Juncus acuminatus*, Michx.
 488. *Juncus biflorus*, Ell.
 22, 37, 203. *Juncus marginatus*, Rostk.
 582. *Chamaelirium Carolinianum*, Walt.

- 112, 295, 580. *Clintonia umbellata* (Michx.) Torr.
 113, 178, 243. *Disporum lanuginosum* (Michx.) Britton.
 132, 572. *Medeola Virginiana*, L.
 190. *Polygonatum biflorum commutatum* (Schultes) Morong. [*Polygonatum commutatum*, Schultes.]
 133, 348, 426. VAGNERA RACEMOSA (L.) Morong. [*Smilacina racemosa*, Desf.]
 485. *Smilax glauca*, Walt.
 337. *Smilax rotundifolia*, L.
 297. *Achroanthos unifolia* (Michx.) Raf.
 487. *Gyrostachys simplex* (A. Gray) Kuntze.
 429. *Leptorchis liliifolia* (L.) Kuntze.
 249, 430, 493. *Peramium pubescens* (Willd.) C. C. Curtiss.
 105. *Pogonia trianthophora* (Sw.) B. S. P.
 104. *Pogonia verticillata* (Willd.) Nutt.
 7, 60. *Alnus serrulata*, Willd.
 114, 165. *Betula lenta*, L.
 72. *Carpinus Virginica* (Marsh.) Sudworth.
 110. *Castanea dentata* (Marsh.) Sudworth.
 181. *Fagus atropunicea* (Marsh.) Sudworth.
 400. *Quercus alba*, L.
 147. *Quercus Prinus*, L.
 247. *Quercus tinctoria*, Bartr.
 329, 443. *Adicea pumila* (L.) Raf.
 336, 441. *Boehmeria cylindrica* (L.) Willd.
 342, 533. *Laportea Canadensis* (L.) Gaud.
 340, 584. *Pyrularia pubera*, Michx.
 41, 84. *Aristolochia Serpentaria*, L.
 286, 343, 516, 591. *Aristolochia Siphon*, L'Hér.
 410. *Polygonum hydropiperoides*, Michx.
 284. *Polygonum Pennsylvanicum*, L.
 552. *Polygonum sagittatum*, L.
 481. *Polygonum scandens*, L.
 447, 515. *Polygonum Virginianum*, L.
 70. *Mollugo verticillata*, L.
 10, 78, 245. *Anychia Canadensis* (L.) B. S. P.
 198. *Anychia dichotoma*, Michx.
 32. *Sagina decumbens Smithii* (A. Gray) S. Wats.
 209. *Magnolia Fraseri*, Walt.
 310. *Magnolia macrophylla*, Michx.
 18. *Magnolia tripetala*, L.
 5. *Asimina triloba* (L.) Dunal.
 575, 593. *Cimicifuga Americana*, Michx.
 153. *Clematis Virginiana*, L.
 244. *Hydrastis Canadensis*, L.
 250, 290. *Thalictrum coriaceum* (Britt.) Small.
 163. *Trautvetteria Carolinensis* (Walt.) A. M. Vail.
 67. *Caulophyllum thalictroides* (L.) Michx.

6. *Menispermum Canadense*, L.
 330, 444, 532. *Lindera Benzoin* (L.) Blume.
 216. *Sassafras Sassafras* (L.) Karst.
 123, 301. *Capnoides sempervirens* (L.) Borkh.
 19. *Podostemon ceratophyllus*, Michx.
 1, 128. *Penthorum sedoides*, L.
 117. *Astilbe biternata* (Vent.) Britton.
 81. *Heuchera Rugelii*, Shuttlew.
 44. *Heuchera villosa*, Michx.
 154, 294, 555. *Hydrangea arborescens*, L.
 87. *Hamamelis Virginiana*, L.
 168, 184, 289, 307. *Agrimonia striata*, Michx.
 193. *Aruncus Aruncus* (L.) Karst.
 71. *Cerasus serotina* (Ehrh.) Loisel.
 305. *Crataegus coccinea*, L.
 65. *Crataegus Crus-Galli*, L.
 226. *Potentilla Monspeliensis*, L. [*P. Norvegica*, L.]
 507. *Pyrus arbutifolia* (L.) L. f.
 85. *Rosa humilis*, Marsh.
 131, 326, 571. *Rubus odoratus*, L.
 76. *Baptisia tinctoria* (L.) R. Br.
 496. *Cassia nictitans*, L.
 439. *Cercis Canadensis*, L.
 100. *Clitoria Mariana*, L.
 267. *Cracca Virginiana*, L.
 328, 442, 558. *Falcata comosa* (L.) Kuntze.
 127. *Lespedeza hirta* (L.) Ell.
 300, 456, 492. *Lespedeza intermedia* (S. Wats.) Britton.
 355, 541. *Lespedeza Nuttallii*, Darl.
 126, 392, 494. *Lespedeza procumbens*, Michx.
 135. *Lespedeza repens* (L.) Bart.
 354, 489, 542. *Lespedeza Virginica* (L.) Britton.
 465, 529, 538. *MEIBOMIA ANGUSTIFOLIA* (Torr. & Gray.) [*Desmodium paniculatum angustifolium*, Torr. & Gray.]
 83, 242. *Meibomia grandiflora* (Walt.) Kuntze.
 261, 406, 458, 576. *Meibomia laevigata* (Nutt.) Kuntze.
 260, 402, 491. *Meibomia Marylandica* (L.) Kuntze.
 80. *Meibomia nudiflora* (L.) Kuntze.
 457. *Meibomia viridiflora* (L.) Kuntze.
 11, 280, 470. *Oxalis recurva*, Ell.
 51, 464. *Linum striatum*, Walt.
 99, 303, 352, 568. *Linum Virginianum*, L.
 164, 265. *Polygala Curtissii*, A. Gray.
 139, 177, 421. *Acalypha gracilens*, A. Gray.
 275, 327, 445. *Acalypha Virginica*, L.
 146. *Euphorbia corollata*, L.
 199. *Euphorbia maculata*, L.

523. *Phyllanthus Carolinensis*, Walt.
 143. *Rhus copallina*, L.
 509. *Ilex opaca*, Ait.
 239. *Euonymus Americanus*, L.
 240. *Acer*, sp.
 223. *Impatiens aurea*, Muhl.
 8. *Impatiens biflora*, Walt.
 409. *Rhamnus Carolinianus*, Walt.
 274, 333, 592. *Ampelopsis quinquefolia* (L.) Michx.
 562. *Vitis æstivalis*, Michx.
 322, 548. *Stuartia pentagyna*, L'Hér.
 136. *Ascyrum hypericoides*, L.
 397. *Hypericum Drummondii* (Grev. & Hook.) Torr. & Gray.
 256. *Hypericum gentianoides* (L.) B. S. P.
 9, 433. *Hypericum maculatum*, Walt.
 12, 16. *Hypericum mutilum*, L.
 75. *Hypericum prolificum*, L.
 220. *Helianthemum majus* (L.) B. S. P.
 495, 565. *Lechea minor*, L. [*L. thymifolia*, Michx.]
 122, 230, 320. *Lechea racemulosa*, Michx.
 246, 345. *Solea concolor* (Forst.) Ging.
 13, 102. *Viola villosa*, Walt.
 271. *Cuphea petiolata* (L.) Koehne.
 66. *Rotala ramosior* (L.) Koehne.
 212. *Circæa Lutetiana*, L.
 94, 519. *Epilobium coloratum*, Muhl.
 15. *Jussiaea decurrens* (Walt.), D. C.
 59. *Ludwigia alternifolia*, L.
 31. *Ludwigia palustris* (L.) Ell.
 116, 148. *Aralia racemosa*, L.
 349, 414, 482. *Aralia spinosa*, L.
 207. *Panax quinquefolia*, L.
 186. *Cicuta maculata*, L.
 499. *Oxypolis rigida* (L.) Raf.
 287. *Sanicula Canadensis*, L.
 241, 423, 547. *Thaspium atropurpureum* (Desr.) Nutt.
 118, 293, 596. *Thaspium barbinode* (Michx.) Nutt.
 302, 490. *Cornus florida*, L.
 17, 546. *Clethra acuminata*, Michx.
 89. *Azalea lutea*, L.
 206. *Azalea nudiflora*, L.
 107. *Gaultheria procumbens*, L.
 182. *Kalmia latifolia*, L.
 144. *Oxydendrum arboreum* (L.) D. C.
 311. *Rhododendron maximum*, L.
 417. *Andromeda ligustrina* (L.) Muhl.
 550. *Gaylussacia ursina* (M. A. Curtis) Torr. and Gray.

82. *Vaccinium corymbosum*, L.
86, 291. *Vaccinium stamineum*, L.
106, 454, 467. *Galax aphylla*, L.
189. *Lysimachia quadrifolia*, L.
121. *Steironema* sp.
473. *Diosyryos Virginiana*, L.
98, 514. *Asclepias obtusifolia*, Michx.
472, 588. *Cuscuta Gronovii*, Willd.
530. *Phlox maculata*, L.
424. *Prunella vulgaris*, L.
455, 545. *Collinsonia Canadensis*, L.,
304, 401. *Cunila Mariana*, L.
64. *Hedeoma pulegioides* (L.) Pers.
157. *Isanthus brachiatus* (L.) B. S. P.
63. *Koellia incana* (Michx.) Kuntze.
228. *Lycopus Virginicus*, L.
92. *Melissa officinalis*, L.
162, 399. *Monarda clinopodia*, L.
469. *Scutellaria lateriflora*, L.
391. *Scutellaria saxatilis*, Riddell.
194. *Stachys cordata*, Riddell.
270. *Trichostema dichotomum*, L.
362, 476, 536, 557. *Chelone glabra*, L.
145. *Dasystema pedicularia* (L.) Benth.
91. *DASYSTOMA LAEVIGATA* (Raf.) Britton. [*Gerardia laevigata*, Raf.]
200. *Ilysanthes gratioloides* (L.) Benth.
183, 225. *Mimulus ringens*, L.
273, 501. *Scrophularia Marylandica*, L.
334, 474. *Epiphegus Virginiana* (L.) Bart.
508, 559. *Cephalanthus occidentalis*, L.
68. *Diodia teres*, Walt.
277. *Galium circæzans*, Michx.
159. *Galium latifolium*, Michx.
233. *Galium pilosum*, Ait.
4, 450. *Galium tinctorium*, L.
30, 213, 232, 537. *Galium triflorum*, Michx.
528. *Houstonia purpurea*, L.
396. *Houstonia tenella*, Pursh. ?
40, 77, 388. *Houstonia tenuifolia*, Nutt.
103. *Mitchella repens*, L.
88, 437. *Viburnum acerifolium*, L.
325. *Viburnum Lentago*, L.
45, 169, 227, 344. *Campanula Americana*, L.
124, 581. *Campanula divaricata*, Michx.
224, 468. *Lobelia cardinalis*, L.
79, 254. *Lobelia inflata*, L.

- 353, 413, 484. *Lobelia puberula*, Michx.
 292, 431, 462. *Lobelia syphilitica*, L.
 446. *Aster azureus*, Lindl.
 161, 390, 535, 570. *Aster divaricatus*, L.
 522, 551. *Aster dumosus*, L.
 262, 412, 459. *Aster infirmus*, Michx.
 356, 526, 549, 569. *Aster lateriflorus* (L.) Britton.
 90a. *Aster leiophyllus lanceolatus*, Porter.
 350, 451. *Aster patens*, Ait.
 435, 525. *Aster prenanthoides*, Muhl.
 252, 268, 564. *Aster surculosus*, Michx.
 90, 259. *Aster undulatus*, L.
 475. *Bidens lewis* (L.) B. S. P.
 346, 403, 453. BRACHYCHÆTA SPHACELATA (Raf.)
cordata (Short) Torr. & Gray.]
 296, 415. *Cacalia atriplicifolia*, L.
 405. *Chrysopsis graminifolia*, Nutt.
 266, 427, 540. *Chrysopsis Mariana* (L.) Nutt.
 553. *Coreopsis tripteris*, L.
 185. *Elephantopus Carolinianus*, Willd.
 394, 438. *Elephantopus tomentosus*, L.
 191, 393, 432, 502. *Erechthites hieracifolia* (L.) Raf.
 218. *Erigeron Canadensis*, L.
 331, 520. *Eupatorium ageratoides*, L. f.
 486. *Eupatorium album*, L.
 175. *Eupatorium pubescens*, Muhl.
 166, 214, 398. *Eupatorium purpureum*, L.
 416. *Eupatorium serotinum*, Michx.
 285, 479. *Eupatorium sessilifolium*, L.
 120, 404. *Eupatorium verbenefolium*, Michx. [*E. teucrifolium*, Willd.]
 219. *Gnaphalium Helleri*, Britt.
 359, 506, 561. *Helenium autumnale*, L.
 179. *Helianthus decapetalus*, L.
 96, 171, 180, 217. *Helianthus parviflorus*, Bernh.
 192. *Heliopsis helianthoides* (L.) B. S. P.
 101, 231. *Hieracium Gronovii*, L.
 167, 255, 418. *Hieracium paniculatum*, L.
 360, 477, 503, 586. *Lactuca spicata* (Lam.) A. S. Hitchcoc
 272. *Pluchea foetida* (L.) D. C.
 339, 460, 556, 589. *Prenanthes altissima*, L.
 440. *Prenanthes Serpentina*, Pursh.
 324. *Rudbeckia laciniata*, L.
 518. *Rudbeckia spathulata*, Michx.
 480. *Sericocarpus asteroides* (L.) B. S. P.
 407, 500, 511, 577. *Solidago arguta*, Ait.
 585. *Solidago arguta*, Ait. (?)
 543. *Solidago bicolor*, L.

- 357, 504. *Solidago Canadensis*, L.
 358, 505, 524, 544. *Solidago Curtisii*, Torr. and Gray.
 170, 238, 422, 563. *Solidago erecta*, Pursh.
 517. *Solidago flexicaulis*, L.
 420. *Solidago nemoralis*, Ait.
 109. *Solidago odora*, Ait.
 498. *Solidago patula*, Muhl.
 531. *Solidago rugosa*, Mill.
 269, 583. *Verbesina alternifolia* (L.) Britton. [*Actinomeris squarrosa*,
 Nutt.]
 483. *Verbesina occidentalis* (L.) Walt.
 188. *Vernonia gigantea* (Walt.) Britton. [*Vernonia altissima*,
 Nutt.]

The Solandi Process of Sun Printing.*

The above title might suggest that the following article should appear, if anywhere, in some journal upon physics, or at least not in one devoted strictly to botany. However, its purpose is only to treat a subject in its relation to the study of plant life, and therefore is offered only as a contribution to botanical technique.

The process consists, briefly, in exposing the subject, necessarily somewhat translucent, to the sunlight in a printing frame in common use by photographers, with a sheet of sensitized paper back of the subject, in the same manner as a print is taken from a negative of the ordinary sort. The paper which has thus far proved the most successful has been the "American Aristotype," for the manner of using which full directions accompany the same, and will not be entered into here.

The sun print thus obtained after it has been toned becomes the negative from which the positive picture is printed. To do this quickly and to the best advantage, the negative print is placed back downward in a dish containing a thin layer of common kerosene, care being taken to wipe it free from all surface oil after being removed. This negative saturated with the kerosene is placed face inward upon a clean plate of glass in the printing

* The substance of this paper, with many illustrative prints, was presented before Section G., A. A. A. S., Madison, August, 1893.